in the primary references. Applicant's U.S. representative also argued an improved performance for a polymer having a C_{20-30} alkyl group as compared with a C_{12} alkyl group, citing the data in applicant's specification. The following is intended to expand upon the discussion with the examiner.

Water-based inks have become popular for use in inkjet recording. The use of permeability controlling agents such as water-soluble organic solvents can lead to degradation of the aqueous dispersion as well as extraction of the dye from the dye-containing polymer. Accordingly, water-based inks comprising aqueous dispersions of polymer particles having good stability in the presence of a permeability controlling agent are sought.

The claimed invention addresses this problem by providing a water-based ink comprising an aqueous dispersion of polymer particles of a water-insoluble polymer having C_{20-30} alkyl groups on its side chain and having an acid value of 30-120 mgKOH/g, and a hydrophobic dye. Applicant has discovered that such a water-insoluble polymer provides for a water-based ink of good stability. Such a water-based ink is nowhere disclosed or suggested in the cited prior art of record.

The rejections of claims 1-3, 5-8 and 10-17 under 35 U.S.C. §103(a) over Nguyen et al., U.S. 5,990,202 in view of WO 2001/96483 and of claims 1-3 and 5-17 under 35 U.S.C. §103(a) over Gore et al., U.S. 2003/0055178 in view of Ishizuka et al. U.S. 2002/0025994 and WO 2001/96483 are respectfully traversed.

Applicant notes the examiner's citation to Yatake et al. U.S. 2003/0106462 as sharing a common PCT priority with WO 2001/96483. For the purposes of this response, applicant will reference the text of Yatake et al. U.S. 2003/0106462.

None of the cited references disclose or suggest a polymer particle of a water-insoluble polymer having an alkyl group of 20-30 carbon atoms in its side chain and having an acid value of 30-120 mg KOH/g.

Each of Nguyen et al. and Gore et al. describe dispersions in which the colorant is encapsulated within a polymer particle. Nguyen et al state at column 2 lines 55-59 "..ink-jet ink compositions are provided which employ specific core/shell polymer formulations that (1) enhance adhesion between the colorant and the core/shell polymer and (2) form durable, smear-fast films on the print medium upon drying." Gore et al. state at page 1, paragraph [0012] "Properties such as water fastness, highlighter resistance, wet rub resistance, dry rub resistance, and substrate adhesion can all be enhanced by choice of a suitable binder." Each reference is clear that the polymer is **a structural component** of the colorant, providing at least the structural properties of substrate adhesion and rub resistance. The references fail to describe a structural polymer in which the polymer is a water-insoluble polymer having an alkyl group of 20-30 carbon atoms in its side chain and an acid value of 30-120 mg KOH/g, as claimed.

The official action at pages 3 and 4 recognizes the deficiencies of the primary references as **failing to teach an acid number as claimed**. The official action relies on Yatake et al. for describing a polymer possessing an acid number of from 20-200 citing the disclosure in paragraph [0233].

Applicant respectfully submits that Yatake et al. is not directed to a structural polymer as are the primary references such that there is no motivation to combine the teachings of the references. More specifically, Yatake et al. describe an ink composition in which a polymer is used to enveloping a pigment and/or dye therein, thereby avoiding problems with loss of dispersant from the pigment (paragraph [0151]). Thus, Yatake et al. is directed to **a polymer**

for surface modification and does not describe the type of structural polymer used in the primary references.

For these reasons, there would be no motivation to use the surface modifying polymer of Yatake et al. as the structural polymer of the primary references.

Moreover, there is no motivation to make the polymer of the primary references have an acid number within the claimed range of 30-120 as an acidic monomer component in the polymers of the primary references is not required.

Nguyen et al. describes a polymer of formula

$[(A)_m(B)_n(C)_p(D)_q(E)_r]_x$

wherein the amount of monomer E, the only monomer which bears an acidic group, is from 0-30 wt.% (column 3, lines 22-50 and column 15, line 33-column 18, line 44). As an optional component, there would be no motivation to ensure that the structural polymer would have an acid number of from 30-120. Moreover, as other monomers in the composition may have a basic group which would not contribute to the acid number and could neutralize pendant acid groups (e.g. monomer E2 column 15, line 58) there is clearly no motivation to ensure an acid value as claimed.

Gore et al describes PNP's which can contain amine monomers which are basic (paragraph [0055]) and therefore there is certainly no motivation to ensure an acid value within the claimed range of from 30-120.

In contrast, the claimed invention is directed to a water-based ink comprising an aqueous dispersion of polymer particles wherein the polymer particles comprise a water-insoluble polymer having an alkyl group of 20-30 carbon atoms in its side chain and has an acid value of 30-120 mgKOH/g and a hydrophobic dye. The polymer is a structural component of the particles in the ink jet dispersion. As the cited references fails to require the presence of acidic monomers, there is no motivation to ensure an acid value of 30-120 mg

KOH/g. Accordingly, the claims which recite as a claim limitation an acid value of from 30 to 120 are not rendered obvious by this combination of references and accordingly withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Moreover, applicant observes an improvement in printing performance and retention of viscosity by selection of an alkyl group having 20-30 carbon atoms, as compared with C_{12}, C_1 and C_2 polymers. The examiner's attention is directed to the data appearing in Tables 1-3 on page 26 of the above-identified application. Comparative examples 1 and 4 are demonstrations of C_{12} polymers, comparative examples 2 and 5 are demonstrations of C_2 polymers and comparative examples 3 and 6 are demonstrations of C_1 polymers. Examples 1 and 2 are a demonstration of a C_{22} polymer. For the examiner's convenience the data from tables 1-3 is reproduced below:

	Optical Density	Printing Reliability
Example 1	1.06	No clogging and no distortion observed
Comparative example 1	1.05	No clogging but slight distortion
Comparative example 2	1.03	No clogging but slight distortion
Comparative example 3	1.01	No clogging but slight distortion

	Ratio of Retaining Viscosity (%)				
Example no	Isopropanol	2-Pyrrolidinone	Diethylene Glycol Monobutyl Ether	Triethylene Glycol Monobutyl Ether	Acetylenol EH
2	98	103	104	100	100
Comp. Ex 4	125	124	126	136	123
Comp. Ex 5	129	120	125	120	129
Comp. Ex 6	132	133	128	130	128

	Ratio of Retaining Average Particle Diameter (%)				
Example no	Isopropanol	2-Pyrrolidinone	Diethylene Glycol Monobutyl Ether	Triethylene Glycol Monobutyl Ether	Acetylenol EH
2	99	102	99	97	104
Comp. Ex 4	125	142	128	142	127
Comp. Ex 5	121	136	127	115	120
Comp. Ex 6	132	146	129	121	124

The data illustrates an improved printing reliability in terms of no observed distortion and retention of viscosity and average particle diameter for the C_{22} alkyl polymer as compared with C_{12}, C_1 and C_2 polymers. As the primary references only broadly suggest an alkyl group of from 2-40 (column 8 of Nguyen et al) and C_{1-24} alkyl ((page 3, paragraph [0035] of Gore et al), there is no expectation of any different result from selection of a C_{20-30} alkyl group. As applicant has demonstrated differences in performance resulting from such a selection, the claimed invention is believed to be non-obvious over the cited references.

Applicant submits that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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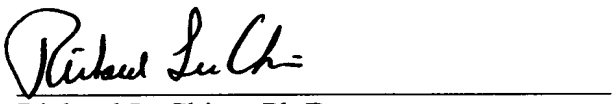

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